

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1. (Currently Amended) A supported or self-supporting electrochemical transistor device comprising:

- a source contact,
- a drain contact,
- at least one gate electrode,
- an electrochemically active element arranged between, and in direct electrical contact with, the source and drain contacts, which electrochemically active element comprises a transistor channel and is of a material comprising an organic material having the ability of electrochemically altering its electrical conductivity through change of redox state thereof,
- a first gate electrode and a second gate electrode, which are separated from each other and from the electrochemically active element, and
- a solidified electrolyte in direct electrical contact with the electrochemically active element and said ~~at least one~~ two gate electrode electrodes and ~~interposed~~

~~between them in such a way that electron flow between the electrochemically active element and said gate electrode(s) is prevented,~~
such that ~~whereby~~ flow of electrons between source contact and drain contact is controllable by means of a voltage applied between to said two gate ~~electrode(s)~~ electrodes.

Claim 2. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 1, ~~in which said~~ wherein the source and drain contacts, gate electrode(s) and electrochemically active element are arranged in one common plane.

Claim 3. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 2, ~~in which~~ wherein a continuous or interrupted layer of ~~said the~~ solidified electrolyte covers the electrochemically active element and covers at least partially ~~said the~~ gate electrode(s).

Claim 4. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 1, ~~in which~~ wherein at least one of said source and drain contacts and gate electrode(s) is formed from the same material as the electrochemically active element.

Claim 5. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 4, ~~in which~~ wherein all of ~~said the~~ source and drain contacts and gate electrode(s) are formed from the same material as the electrochemically active element.

Claim 6. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 4, ~~in which~~ wherein the source and drain contacts and the electrochemically active element are formed from a continuous piece ~~of said~~ the material comprising an organic material.

Claim 7. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 1, ~~in which said~~ wherein the transistor channel retains its redox state upon removal of the gate voltage.

Claim 8. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 1, ~~in which said~~ wherein the transistor channel spontaneously returns to its initial redox state upon removal of the gate voltage.

Claim 9. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 8, ~~in which~~ wherein the electrochemically active element further comprises a redox sink volume adjacent to the transistor channel, ~~the device comprising~~ and wherein the electrochemical transistor device further comprises at least two gate electrodes arranged on opposite sides of the electrochemically active element so that one gate electrochemically active element so that one gate electrode is closer to the transistor channel and one gate electrode is closer to the redox sink volume.

Claim 10. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 1, ~~in which said~~ wherein the organic material is a polymer material.

Claim 11. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 10, ~~in which said~~ wherein the polymer material is selected from the group consisting of polythiophenes, polypyrroles, polyanilines, polyisothianaphtalenes, polyphenylene vinylenes and copolymers thereof.

Claim 12. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 11, ~~in which said~~ wherein the polymer material is a polymer or copolymer of a 3,4-dialkoxythiophene, ~~in which said~~ wherein the two alkoxy groups may be the same or different or together represent an optionally substituted oxy-alkylene-oxy bridge.

Claim 13. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 12, ~~in which said~~ wherein the polymer or copolymer of a 3,4-dialkoxythiophene is selected from the group consisting of poly(3,4-methylenedioxythiophene), poly(3,4-ethylenedioxythiophene), poly(3,4-propylenedioxythiophene), and poly(3,4-butylenedioxythiophene).

Claim 14. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 1, ~~in which said~~ wherein the organic material further comprises a polyanion compound.

Claim 15. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 14, ~~in which said~~ wherein the polyanion compound is poly(styrene sulphonc acid) or a salt thereof.

Claim 16. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 1, ~~in which said~~ wherein the solidified electrolyte comprises a binder.

Claim 17. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 16, ~~in which said~~ wherein the binder is a gelling agent selected from the group consisting of gelatine, a gelatine derivative, polyacrylic acid, polymethacrylic acid, poly(vinylpyrrolidone), polysaccharides, polyacrylamides, polyurethanes, polypropylene oxides, polyethylene oxides, poly(styrene sulphonc acid) and poly(vinyl alcohol), and salts and copolymers thereof.

Claim 18. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 1, ~~in which said~~ wherein the solidified electrolyte comprises an ionic salt.

Claim 19. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 1, ~~which is~~ wherein the electrochemical transistor device is self-supporting.

Claim 20. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 1, ~~which is~~ wherein the electrochemical transistor device is arranged on a support.

Claim 21. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 20, ~~in said~~ wherein the support is selected from the group consisting of polyethylene terephthalate, polyethylene naphthalene dicarboxylate, polyethylene, polypropylene, polycarbonate, paper, coated paper, resin-coated paper, paper laminates, paperboard, corrugated board and glass.

Claim 22. (Currently Amended) A process for the production of a supported electrochemical transistor device comprising the steps of:

- forming a source contact,
- forming a drain contact,
- forming at least one gate electrode,
- forming an electrochemically active element arranged between, and in direct electrical contact with the source and drain contacts, wherein said electrochemically

active element comprises a transistor channel and is of a material comprising an organic material having the ability of electrochemically altering its electrical conductivity through change of redox state thereof,

- forming a first gate electrode and a second gate electrode, which are separated from each other and from the electrochemically active element, and

- forming a solidified electrolyte in direct electrical contact with the electrochemically active element and said ~~at least one~~ first and second gate electrode electrodes and ~~interposed between them in such a way that electron flow between the electrochemically active element and said gate electrode(s) is prevented,~~

wherein said contacts, ~~electrode(s)~~ electrodes, and electrochemically active element and electrolyte are deposited directly onto a support.

Claim 23. (Currently Amended) ~~A~~ The process according to claim 22, wherein ~~said the~~ contacts, electrode(s), electrochemically active element and/or electrolyte are deposited by means of printing techniques.

Claim 24. (Currently Amended) ~~A~~ The process according to claim 22, wherein ~~said the~~ contacts, electrode(s), electrochemically active element and/or electrolyte are deposited by means of coating techniques.

Claim 25. (Currently Amended) ~~A~~ The process according to claim 22, ~~in which~~
~~said wherein the~~ organic material comprises a polymer, wherein ~~said the~~ polymer is
deposited on the support through *in situ* polymerisation.

Claim 26. (Currently Amended) ~~A~~ The process according to claim 22,
comprising patterning of any one of ~~said the~~ contacts, electrode(s) and electrochemically
active element using a subtractive method.

Claim 27. (Currently Amended) ~~A~~ The process according to claim 26, ~~in which~~
~~said wherein the~~ patterning is performed through chemical etching.

Claim 28. (Currently Amended) ~~A~~ The process according to claim 26, ~~in which~~
~~said wherein the~~ patterning is performed through gas etching.

Claim 29. (Currently Amended) ~~A~~ The process according to claim 26, ~~in which~~
~~said wherein the~~ patterning is performed by mechanical means selected from the group
consisting of scratching, scoring, scraping and milling.

Claim 30. (Canceled)

Claim 31. (Currently Amended) ~~An~~ The electrochemical transistor device according to claim 5, ~~in which~~ wherein the source and drain contacts and the electrochemically active element are formed from a continuous piece of said material comprising an organic material.

Claim 32. (Currently Amended) ~~A~~ The process according to claim 23, ~~in which~~ wherein the organic material comprises a polymer, wherein said polymer is deposited on a support through *in situ* polymerisation.

Claim 33. (Currently Amended) ~~A~~ The process according to claim 24, ~~in which~~ wherein the organic material comprises a polymer, wherein said polymer is deposited on a support through *in situ* polymerisation.

Claim 34. (Currently Amended) ~~A~~ The process according to claim 23, comprising patterning of any one of said contacts, electrode(s) and electrochemically active element using a subtractive method.

Claim 35. (Currently Amended) ~~A~~ The process according to claim 24, comprising patterning of any one of said contacts, electrode(s) and electrochemically active element using a subtractive method.

Claim 36. (New) The supported or self-supporting electrochemical transistor device according to claim 1, wherein the electrochemically active element further comprises a redox sink volume, and wherein the first gate electrode is associated with the transistor channel and the second gate electrode is associated with the redox sink volume.

Claim 37. (New) The supported or self-supporting electrochemical transistor device according to claim 1, wherein the solidified electrolyte is arranged in two separate electrolyte elements, a first electrolyte element being in contact with the first gate electrode and a second electrolyte element being in contact with the second gate electrode.

Claim 38. (New) The supported or self-supporting electrochemical transistor device according to claim 1, wherein the solidified electrolyte covers, at least partially, the first gate electrode, the second gate electrode, and the electrochemically active element.

Claim 39. (New) The supported or self-supporting electrochemical transistor device according to claim 1, wherein solidified electrolyte is interposed between the first gate electrode and the electrochemically active element and between the second gate electrode and the electrochemically active ingredient.

Claim 40. (New) The process for the production of a supported electrochemical transistor device according to claim 22, wherein the step of forming an electrochemically

active element furthermore involves forming a redox sink volume, and such that the first gate electrode is associated with and the second gate electrode is associated with the redox sink volume.

Claim 41. (New) The process for the production of a supported electrochemical transistor device according to claim 22, wherein the step of forming solidified electrolyte involves forming two separate electrolyte elements, a first electrolyte element being in contact with the first gate electrode and a second electrolyte element being in contact with the second gate electrode.

Claim 42. (New) The process for the production of a supported electrochemical transistor device according to claim 22, wherein the step of forming solidified electrolyte involves covering, at least partially, the first gate electrode, the second gate electrode, and the electrochemically active element with solidified electrolyte.

Claim 43. (New) The process for the production of a supported electrochemical transistor device according to claim 22, wherein the step of forming solidified electrolyte involves arranging solidified electrolyte between the first gate electrode and the electrochemically active element and between the second gate electrode and the electrochemically active element.